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NOTES ON THE GENUS *COPABLEPHARON* (HARVEY) IN ALBERTA

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Lethbridge, Alberta.

The Genus *Copablepharon*, erected by Harvey in 1878, ⁽¹⁾ is one of the smaller and rarer genera of the Noctuidae, composed almost entirely of western species. Harvey erected the genus for a single Californian species *absidum* Harv. which Wolley-Dod recorded from Calgary, Alberta, on the authority of Fletcher, as No. 385 on his "List." ⁽²⁾ Barnes and McDunnough ⁽³⁾ list six species of this genus and of these six, four have been recorded from Alberta. Three of the four species have been collected at Lethbridge and the fourth has been taken in the southeastern corner of the province near Pakowki.

In 1913, Strickland took a single Noctuid larva from a stubble field near Lethbridge and reared it. He was very much struck with the extreme length of the proboscis sheath of the pupa and made very accurate descriptions and drawings which were later published along with a taxonomic note on the genus ⁽⁴⁾. This specimen turned out to be *C. grandis* Strkr. Wolley-Dod records this species from High River and several specimens were taken at the laboratory light trap at Lethbridge in 1921.

Wolley-Dod had misgivings about the occurrence of *C. absidum* in Alberta, and in 1913 ⁽⁵⁾ stated that the two female specimens he had from Calgary were not *absidum* but were probably a new species. In July, 1915, Strickland took a single male specimen at the light trap at Lethbridge which Wolley-Dod decided was the same species as the two females and described the species as *C. viridisparsa* ⁽⁶⁾. This species has since been taken at light at Lethbridge but only rarely. Gibson ⁽⁷⁾ on the authority of E. H. Blackmore recorded a specimen of *C. viridisparsa*, collected at Lillooet, B. C., Aug. 24, 1916, by A. W. A. Phair.

A report of numbers of cutworms infesting the edge of a rye field was received from Granum in April, 1921. As this district had been infested with *Porosagrotis orthogonia* the previous year there was considerable alarm among the farmers because of this very early appearance of well developed larvae. Investigation revealed the fact that there was only one field in the district which was infested and in this field the larvae were found only in the drifted soil along the fence. There was no sign of any injury to the rye and the only plant life in the drift, which had been fed upon freely, was one of the mustards. The cutworms were fairly abundant about one inch below the surface of the soil but all the feeding had been done above ground. A long series of larvae were collected and brought to the laboratory for rearing. The moths which emerged later in the season were determined by Dr. McDunnough as *Copablepharon viridisparsa*.

—Contribution from the Division of Field Crop and Garden Insects, Entomological Branch, Dept. of Agric., Ottawa.

The larvae were practically all in the seventh instar and at first glance resembled the larvae of *Euxoa ochrogaster*, except that the ground color was cream and the red was much lighter. The most striking thing was that the ventral surface of all these larvae seemed to be almost a sky blue, due probably to the food they had eaten, but it was later noticed that even when they had not eaten the bluish tinge still remained though not as distinct.

In general the larvae are cream colored with a reddish-tan subdorsal stripe and a very slightly darker stigmatal stripe. The ventral surface is distinctly bluish and this color is rather pronounced when the larvae have been feeding on green food, much more so than in most Noctuid larvae. The entire head and all its appendages are concolorous, a light grayish brown, as is also the thoracic shield except for two black dots at the posterior margin. The tubercles are black or brown and of uniform size, all being much smaller than the tubercles of *Euxoa* species.

The larvae are usually very active when disturbed and will crawl rapidly over the surface of the soil or across the hand. They are also very rapid diggers and bury themselves in the soil in an incredibly short time. For the most part the larvae were reared in tin boxes but the few that were given the chance made an earthen cell for pupation about two inches below the surface of the soil.

The pupa is distinctive in that the maxillae are exceedingly long, being two fifths longer than the wings and reaching to the posterior margin of the 9th abdominal segment. The cremaster is short, rugose and terminates in straight, slightly divergent and moderately close-set spines. The pupal period varied from 21 to 31 days but averaged 24 days, the first moths emerged the first of July.

The moths fly for a very short time and as the eggs are well developed on emergence it is doubtful if the moths are flying for more than two weeks. All the flight records made at the Lethbridge laboratory light-trap indicate that the moths are present during the first ten days of July and no later. The eggs are laid during this time and hatch the same season. The larvae develop and go into the winter partially grown and are among the first active Noctuid larvae in the spring.

Several of the larvae collected at this time were parasitised by both Hymenoptera and Diptera, but only one parasite ever emerged, namely, a Tachinid, *Bonnetia compta* Fall., which emerged on July 9 after a pupal period of 21 days.

In the southeastern corner of Alberta there is a large alkali lake usually mapped as Pakowki Lake but known locally as Badwater Lake. The country around this lake is a sand dune region which cuts diagonally across this portion of the province as a narrow strip three or four miles wide and thirty or forty miles long, cropping out at intervals into fairly large areas of pure sand. Much of this sand drift is held in check by wild rose and choke-cherry bushes and rather extensive grassy meadows.

While collecting in this dune area on the third of June, 1922, it was noticed that the younger shoots of the rose bushes growing in the sand were frequently dead or dying and closer inspection showed that they had been cut off about an inch below the surface of the sand. The sand was scraped away from several

such shoots and in each case a Copablepharon larva was found. These larvae resembled closely those found at Granum, having the very distinctive bluish color on the ventral surface. A long series was collected for rearing and taken to the insectary at Lethbridge.

The majority of these larvae were in the 5th and 6th instars and all were found feeding below the surface of the ground. Those which were collected at Granum were in the 6th and 7th instars and while the larvae were found below the surface of the ground there was no evidence of any feeding except above the surface. These facts and differences that appeared when making more detailed descriptions of the larvae indicated that they were not *C. viridisparsa*, and when the moths emerged they were determined by Dr. McDunnough as *C. longipennis* Grt. This species has also been reared by Mr. N. Criddle in Manitoba, from larvae found in sand dune country similar to that in Alberta.

In general the larvae of this species are darker than those of *C. viridisparsa*, the reddish stripes being more of a brown-red than a reddish-tan and the ground color grey instead of cream. The stripes and the distinctly bluish ventral surface are the same. The head and the thoracic shield are light brown, somewhat mottled with gray. The tubercles are dark brown and very small all being practically of the same size.

The majority of the larvae pupated during the third week in July, the pupae all having the extremely long maxillae. This species differs from the others in that the maxillae only reach to the posterior margin of the sixth abdominal segment. The cremaster is short and smooth and terminates in straight, slightly divergent and moderately close set spines.

The pupal period varied from 17 to 19 days and all the moths emerged during the first week in August. There are no records of this species having been taken at the light trap at Lethbridge so the species may be confined to the sand dune area. Holland records ⁽⁸⁾ this species from Montana but does not indicate the type of country in which it has been found.

None of the larvae of this species that were collected were parasitized. This is probably due to the fact that the larvae are subterranean feeders and seldom lay themselves open to parasite attack. Most of the cutworm parasites which oviposit on the food plants select grasses and the fact that this species was found feeding entirely on rose bushes may account for the lack of this type of parasite.

A very few specimens of *C. alba* Harv. have been taken during late July and early August at the laboratory light trap. In most cases these have been badly rubbed and the determination is made by Dr. McDunnough with a query. The larvae of this species have never been found in this vicinity during the last few years nor are there any records, other than those mentioned, of the capture of the moths.

LITERATURE CITED, IN ORDER OF REFERENCE.

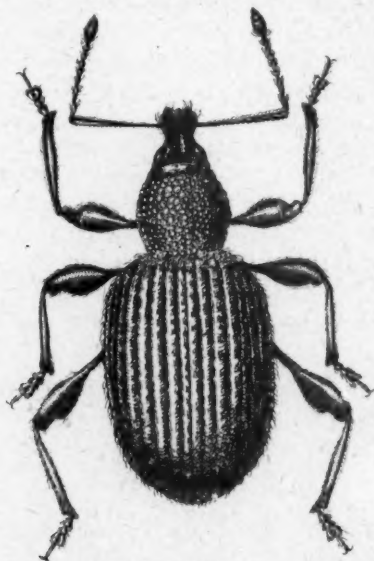
1. Harvey, Canadian Entomologist, Vol. 10, p. 57, 1878.
2. Wolley-Dod, Canadian Entomologist, Vol. 37, p. 247, 1905.
3. Barnes and McDunnough, Check List of Lepidoptera of Boreal America. 1917.
4. Strickland, Psyche, Vol. 27, p. 81, 1920.

5. Wolley-Dod, Canadian Entomologist, Vol. 45, p. 187, 1913.
6. Wolley-Dod, Canadian Entomologist, Vol. 48, p. 60, 1916.
7. Gilson, Entomological Record 1918, Rep. Ent. Soc. Ont. 1918.
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HISTORICAL NOTES ON BRACHYRHINUS RUGIFRONS GYLL.

BY F. H. CHITTENDEN,
Bureau of Entomology.

Several localities in America for this introduced species have been recorded by Pierce, Blatchley and Leng. Quite recently it has made its appearance in the Pacific States in such injurious numbers that attention has been called to it in published articles. As the species is evidently destined to spread as a pest on strawberry, it may be well to relate in brief what is known in regard to its early occurrence in this country. Specimens are available that were collected in the vicinity of New York City by Wilhelm Juelich on September 7, 1891, but there are specimens, also, bearing old-looking labels, from Grand Menen, British Columbia, and Toronto, Ontario, Canada, which would seem to indicate that the species was known at least as early, if not earlier, in those two localities.



In 1906 it was reported by J. F. Fuss as occurring in troublesome numbers in residences in Washington, D. C., and attracted attention at Ithaca, N. Y., in 1907 and 1910 by its occurrence in numbers in cellars and pantries and elsewhere in dwellings. We next hear of the species, in the records of the Bureau of Entomology, on strawberry at Seattle, Wash., in 1914, and again on strawberry at Washougal, Wash., in 1918. In 1920 it was noted in Alameda County and San Francisco, Calif. Other known localities include Portage, N. Y., Newark, N. J., Bethlehem, Pa., Fredericksburg, Va., and Quebec, Canada. Quite obviously, in the writer's opinion, the species reached this country from at least

two directions, from Europe and from Asia. Probably it first appeared in Canada and might have been introduced into the United States from there or independently, but the California and Washington introductions are undoubtedly independent of those in the East. The species is as yet unknown in the Central States between Pennsylvania and the Pacific Coast.

Abroad, this species is known to inhabit northern Europe only but it will probably be found in northern Asia. It will be interesting to learn if this pest can become permanently acclimated much farther south than San Francisco, Calif., and if at all in the District of Columbia.

A NEW SPECIES OF THE LITHOBIID GENUS NAMPABIUS FROM TENNESSEE.

BY RALPH V. CHAMBERLIN,
Cambridge, Mass.

The writer has recently received for identification a number of lithobiids found living in a cave in Tennessee. These specimens prove to represent a very distinct new species in the genus *Nampabius*. A description of the form follows.

Nampabius major sp. nov.

Dorsum in general brown, with a darker longitudinal median line which geminates a lighter stripe on some of the tergites; darker at anterior and posterior ends. Head chestnut and more or less dusky. Antennae chestnut. Venter pale brown or yellowish. Legs yellow, the posterior pairs darker. Ocelli about fifteen in number, arranged in four series; e.g., 1 + 4, 4, 3, 3. Dorsal spines of anal legs 0, 0, 2, 0, 0; ventral, 0, 1, 1, 1, 0. Dorsal spines of penult legs, 0, 0, 2, 1, 0. Ventral spines of penult legs, 0, 1, 1, 1, 0. Dorsal spines of twelfth legs, 0, 0, 2, 1, 2. Claw of female gonopods tripartite; the lobes distinct and acute; outer of basal spines longer than the inner one. Lobe at distal end of tibiae of penult legs of male with distal surface long, the lobe projecting distad beyond its base and appearing oblique; distal setae few, of moderate length.

Length of female, up to 10 mm.; the males smaller.

Locality.—Tennessee: Jefferson City. Twelve specimens representing both sexes. Mr. J. D. Ives.

The letter from Mr. Ives accompanying the specimens states that the "animals were living in a cave of a little over a mile in length. Within the cave the animals had for their habitat a mound of bat faeces, situated about one fourth of a mile from the entrance and in absolute darkness." It may be noted, however, that the species shows no special adaptation to cave life. The eyes are unusually well developed for a member of the genus.

The species is distinct from all others in having the dorsal spines of the penult legs 0, 0, 2, 1, 0, the fourth joint being unarmed dorsally in the other known species. It is also decidedly the largest species known in the genus, none of the others exceeding 7.5 mm. and most of them being well under this length. In the key to species given by the writer in his revision of the genus (Bull. M. C. Z., 1913, 57, p. 41), this species runs out to *virginiensis*, but the latter may readily be separated by the difference in the dorsal spining of the penult legs, its greater size, and various other characters.

DESCRIPTIONS OF TWO INSECTS FOUND IN IMPORTED FOOD-STUFFS.*

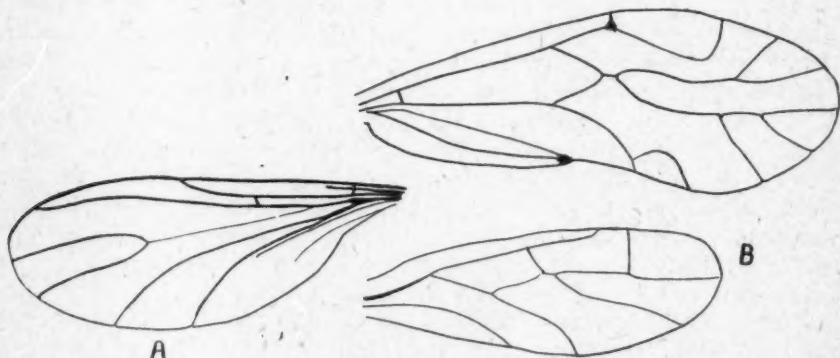
BY C. H. CURRAN,
Ottawa, Ont.

The insects herewith described represent apparently new forms and have been intercepted in foodstuffs imported from Argentina and China. Neither of the forms is likely to prove of much economic importance and it is improbable that either could become established in Canada on account of severe winters.

PSOCIDAE

***Caecilius nigrotuberculatus* n. sp.**

Length of wing 1.5 mm. Pale rusty brown, the head below the eyes, under surface of abdomen, apices of coxae and the legs pale yellowish, the tarsi brownish apically. Antennae pale brown, the second and third segments yellowish, the third becoming darker apically. Abdomen obscure yellowish above with the segmental apices broadly brown. Immediate base of wings reddish yellow, the membrane slightly greyish, the veins dark brown, usually faintly clouded with fuscous, a black spot at posterior end of stigmal crossvein and at apex of anal cell, the wings without hairs, their venation as in fig. 1B. Tibiae with numerous tiny brown or black tubercles arranged in rather regular rows, the tubercles less evident on the anterior legs. First tarsal segment longer than the remaining segments.



Described from 12 specimens taken from ship with cargo of corn from Argentina. The specimens were collected by Mr. Wm. Ryan at Montreal on June 23, 1925.

Type No. 1543 in the Canadian National Collection, Ottawa.

DIPTERA—SCIARIDAE

***Sciara transpacifici* n. sp.**

Length about 2.5 mm. *Male*. Blackish or brownish black, with golden hairs. Face with rather golden brown pollen, a little prominent, above the mouth with about six brownish bristly hairs, the median ones stronger. Palpi greyish yellow pollinose, the first joint swollen, the others slender. Eyes very narrow above, contiguous. Occiput large, convex, thinly brownish pollinose, the ocellar swelling transversely oval, more evident laterally, the anterior ocellus slightly in front of the laterals. Antennae unicolorous, clothed with short golden yellow

*—Contribution from Entomological Branch, Dept. of Agric., Ottawa.

hairs, the first six flagellar segments with four or five very short, black, apical bristles.

Femora paler brown below, the legs without evident hair except the extremely short hairs on the posterior four tibiae and tarsi, the middle and hind tibiae each with four tiny, fine bristles in a row on the lower surface, the hair quite conspicuous on the upper surface. First segment of posterior tarsus with a complete row of short, fine bristles on each lower edge, the second segment with three or four. Tibial spurs short, brownish yellow. Pulvilli very small, yellowish; claws small, black.

Wings lightly cinereous, the immediate base yellow, the auxiliary vein very short; venation as in fig. 1A. Squamae luteous. Halteres fuscous, the stem yellow.

Abdomen slightly shining. Genitalia moderately large, the outer arms twice as long as wide, gently concave inwardly.

A single ♂ taken from "Underground ginger roots" imported from Hongkong, China, intercepted at Toronto, Ont., by Mr. J. G. McPharlin.

Holotype—No. 1542 in the Canadian National Collection, Ottawa.

NEW PHYLLOPHAGA (SCARABAEIDAE)*

BY ROBERT D. GLASGOW,

University of Illinois.

For the convenience of other students of the group, it seems desirable to publish in advance of a forthcoming contribution on the Phyllophaga, the following descriptive notes on a new species and a new variety of that genus.

Phyllophaga paterno n. sp.¹

Length 17-19 mm. Oblong-oval, usually slightly broader behind. Reddish brown to very dark chestnut; glabrous above except for occasional minute, closely recumbent hairs borne by some of the pits on the pronotum; shining. Clypeus moderately and rather broadly emarginate, margin narrowly reflexed; clypeus and front coarsely and very densely punctate, approaching rugulose. Antennae 10-jointed. Pronotum broad, sides arcuate, nearly parallel behind, converging in front; margins entire or subcrenate, sparsely ciliate, ciliae short; surface coarsely, irregularly, and rather sparsely punctate. Elytra rather finely and closely but vaguely punctate, subrugulose above; sutural costae distinct, discal and submarginal costae almost obsolete. Pygidium rather coarsely and not closely punctate. Metasternum rather finely but indistinctly punctate; hairs moderately short and rather sparse. Sides of abdomen rather finely and sparsely punctate; hairs short and closely recumbent. Claws arcuate, tooth strong, median, acute.

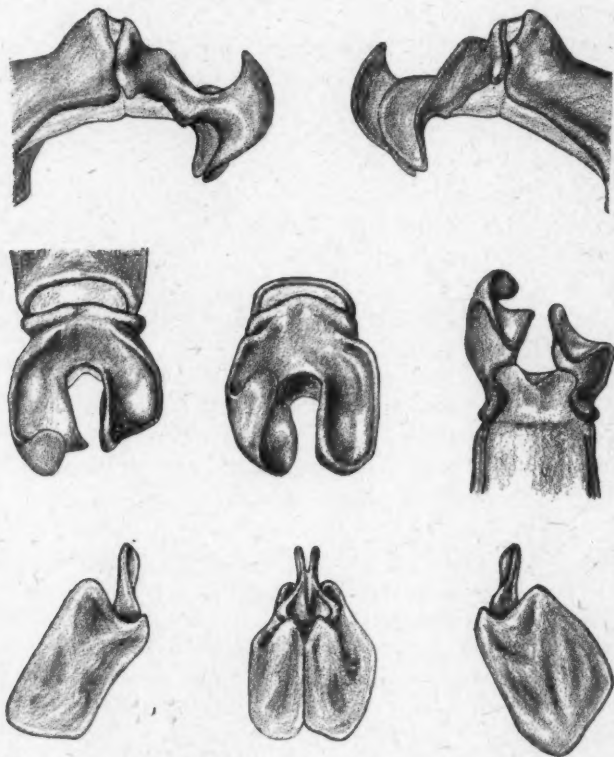
Male. Club of antennae about as long as funiculus. Hind tibia obliquely truncate; one spur fixed, fixed spur but little flattened, slightly curved, slender, acute, nearly as long as free spur; free spur more distinctly flattened, slightly curved, slender and acute. Abdomen flattened at middle; penultimate ventral

*—Contribution from the Entomological Laboratories of the University of Illinois, Number 93.

1.—This species is named in honor of the writer's friend, Mr. Antonio M. Paterno. Mr. Paterno has assisted in shading many of the figures of *Phyllophaga* drawn by the writer in the course of his studies of that group.

segment tuberculate at middle, with a transverse impression parallel to the posterior margin, and with an anterior median elevation, vaguely arcuate in form and terminating laterally in a series of small, oblique, fold-like ridges; last ventral segment broadly and irregularly concave.

Female. Club of antenna shorter than funiculus. Penultimate ventral segment variable, usually with a more or less clearly defined transverse impression parallel to the posterior margin.



Phyllophaga paternoi n. sp.

Remarks. This species is very close to *P. fraterna* Harris and to *P. foxii* Davis and can scarcely be distinguished from either species by any formal description of external characters alone. The genitalia of both sexes, however, while of the same general type, as indicated by the accompanying figures, are strikingly different from either *fraterna* or *foxii*, and demonstrate clearly the specific distinctness of this form.

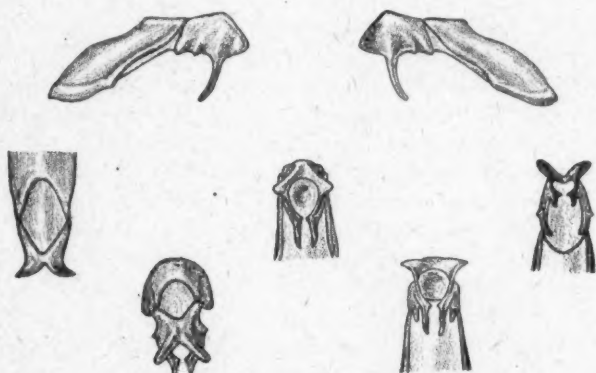
This species is known to the writer only from the coastal region of Virginia and North Carolina.

***Phyllophaga gracilis angulata* n. var.**

Length 10.5-12 mm. Elongate, subcylindrical. Medium yellowish brown, pronotum somewhat darker than elytra, head dark brown; glabrous above; feebly shining. Head broad, eyes large, especially in male; clypeus deeply emar-

ginate, margin moderately reflexed; clypeus and front rather coarsely, somewhat irregularly, but not closely punctate. Antennae 10-jointed. Pronotum convex, broad, sides arcuate, nearly parallel or slightly converging behind, converging more strongly in front; margins entire or very feebly subcrenate, ciliate; surface rather coarsely, somewhat irregularly and not closely punctate. Elytra rather coarsely, closely, and evenly punctate; sutural costae distinct, other costae almost completely obsolete. Pygidium feebly shining, rather coarsely, sparsely, and indistinctly punctate. Claws uniformly curved, tooth small and distinctly intramedian.

Male. Club of antenna longer than stem. Hind tibia obliquely truncate, one spur fixed, both spurs slender, somewhat flattened, free spur straight and acute; fixed spur more or less bluntly spatulate at tip and bent and at the same time twisted to form a section of a long helix. Abdomen flattened at middle; penultimate ventral segment with a transverse arcuate elevation at middle in front of a transverse impression parallel with the caudal margin; last ventral segment broadly and not deeply concave.



Phyllophaga gracilis angulata n. var.

Female. Club of antennae shorter than funiculus. Spurs of hind tibia slender, flattened, slightly curved, acute, not appreciably twisted.

Remarks. In form and sculpture this variety is essentially like the type form of the species. The specimens before the writer, however, average a little smaller than the average for *P. gracilis gracilis*, the surface is slightly more opaque, and the color is somewhat darker. The claws in the male of *P. gracilis angulata* are more uniformly arcuate, and the tooth is distinctly intramedian. The male hind tibial spurs of this variety also, are shorter and less strongly twisted than in the type form.

The most striking difference, of course, appears in the male genitalia. In *P. gracilis gracilis* the dorso-caudal margins of the lateral lobes are uniformly arcuate, while in *P. gracilis angulata* the dorso-caudal margins of the lateral lobes are extended on each side to form a broad, angulate process, the sides of which form an angle of approximately sixty degrees, and which is curved in a dorso-lateral direction. The ventral processes in *P. gracilis angulata*, also, are rather longer, and more slender than in *P. gracilis gracilis*, and the mesal tooth

of these processes is farther from the base.

Aside from the general habitus, the female of this variety presents few definitely distinctive characters.

The only specimens known to the writer were taken in the coastal regions of New Jersey and Virginia.

A PRELIMINARY REVISION OF THE CAMPOPLEGINAE IN THE
CANADIAN NATIONAL COLLECTION, OTTAWA.

BY HENRY L. VIERECK,

Ottawa, Ont.

(Continued from page 228)

Campoctonoides new genus

Related to *Neonortonia* Viereck from which it differs especially in habitus, and in its areolate propodeum.

Genotype.—*C. currani* n. sp.

C. currani n. sp.

Female.—Length 10 mm.; black, including most of the antennae, mandibles mostly dark, fore legs mostly yellow, their coxae mostly black, mid tibiae and tarsi mostly yellow, their coxae and femora mostly black, the latter with a yellow tip, mid trochanters partly yellow, hind legs mostly blackish, their tibiae with a yellow tip, mid trochanters partly yellow, hind legs mostly blackish, their tibiae with a yellow stripe above separated by a blackish stripe, abdomen reddish except as follows—petiole dark stramineous, post petiole blackish with pale, stramineous margin, second tergite blackish, pale stramineous at base and apex, third tergite pale stramineous at base and along the lateral margin save for a black stripe and with blackish stain near the base, plica yellowish, sheaths blackish with a stramineous tip; propodeum dullish, mostly convex, the apical half narrowly, shallowly concave, transversely costate.

Male. Length 10 mm.; characters essentially as in the female but with a single yellow stripe on the hind tibiae.

Holotype—♀, Sebright, Ont.: July 16, 1923, (C. H. Curran); No. 1564, in the Canadian National Collection, Ottawa.

Allotype—♂, Lanoraie, Quebec, June 16, 1915, (J. I. Beaulne).

Campoctonoides buckelli n. sp.

Related to *C. currani* Viereck.

Female. Length 4 mm.; black, apical edges of scape pale stramineous, flagel missing, mandibles mostly yellowish, tegulae partly yellowish, legs stramineous excepting the hind coxae which are mostly blackish, abdomen reddish except for the first tergite, the basal three-fourths of the second tergite and stains on the dorsal aspect and upper lateral aspect of the fifth and following tergites which parts are black or blackish: areola acute at base; postpetiole with three impressions, one in the middle and one on each side.

Holotype—♀, Nicola, B. C., July 28, 1923, (E. R. Buckell); No. 1567 in the Canadian National Collection, Ottawa.

Campoctonoides beaulnei n. sp.

Related to *C. currani* Viereck.

Female. Length 7 mm.; black, including the antennae, mandibles mostly yellowish, fore coxae black, their trochanters partly pale, their femora dark stramineous, their tibiae and tarsi yellowish, tegulae blackish with a stramineous margin, mid legs black or blackish, their femora tipped with yellow like the fore femora, mid tibiae and tarsi dark stramineous, hind legs nearly entirely blackish throughout, their tibiae reddish at apex, their spurs pale stramineous, abdomen reddish, first tergite black, broadly reddish at apex, plica yellowish; propodeum, broadly shallowly concave, the concavity transversely wrinkled, a nearly completely defined areola present that is truncate at base.

Male. Characters essentially as in the female, fore femora yellowish and dark stramineous, tegulae yellowish stramineous, mid tibiae and tarsi yellowish, post petiole narrowly reddish at apex, second tergite blackish at base, end tergite blackish.

Holotype—♀, Ft. Coulonge, Que., July 23, 1919, (Jos. I. Beaulne); No. 1563 in the Canadian National Collection, Ottawa.

Allotype—♂, Elk Island, Alta., Aug. 4, 1923, (E. H. Strickland).

***Campoctonoides harringtoni* n. sp.**

Related to *C. beaulnei* Viereck.

Female. Length 8 mm.; looks like *C. beaulnei* Viereck from which it differs especially as follows—fore coxae black and stramineous, fore legs with their proximal trochanter partly, their distal trochanter entirely, yellow, their femora yellowish and stramineous, tegula yellow with a stramineous margin, mid coxae and trochanters mostly blackish, their femora mostly reddish, their tibiae and tarsi mostly yellowish, hind femora apically and their tibiae mostly, reddish-brown, their tarsi fuscous; concavity of propodeum transversely costate, the areola acute at base.

Holotype—♀, Ottawa, Ont., (W. H. Harrington); No. 1565 in the Canadian National Collection, Ottawa.

Paratype—♀, with the same data as the holotype.

Paratype with the areola narrowly truncate at base.

***Campoctonoides johanseni* n. sp.**

Related to *C. harringtoni* Viereck.

Female. Length 5 mm.; black, scape and pedicel contrastingly pale stramineous with the black flagel, tegulae yellowish, legs reddish excepting the fore and mid coxae and all trochanters which are mostly yellowish, abdomen reddish except for the first tergite which is black barring the reddish apical half of the postpetiole and the second tergite which is blackish at base, sheaths blackish; areola nearly equilateral, virtually complete and acute at base.

Male. Characters essentially as in the female, the underside of the first four joints of the flagel brownish.

Holotype—♀, Alright Isl., Que., Aug. 7, 1917 (F. Johansen); No. 1566 in the Canadian National Collection, Ottawa.

Allotype—♂, with the same data as the holotype.

Paratypes—♀ ♀ and ♂ with the same data as the holotype.

The paratypes indicate that the color of the flagel is variable in both sexes from blackish to blackish with the underside at and near the base brownish.

Sesioplex heliaeformis n. sp.

Related to *S. heliae* Ashmead.

Female. Length 5 mm.; black including the antennae, mandibles mostly yellowish, palpi stramineous, tegulae yellowish, fore and mid coxae almost reddish-stramineous, proximal trochanters blackish, hind coxae black, distal trochanters yellowish, femora reddish, fore and mid tibiae stramineous, fore and mid tarsi brownish, hind tibiae reddish, their tarsi infuscated, abdomen black, the second tergite with the apical reddish, third tergite with the apical third and a lateral margin reddish, fourth tergite with the apical third and all of its sides reddish to stramineous, fifth and sixth tergites stramineous apically with their sides reddish, sheaths blackish and apparently as long as the first tergite, plica yellowish; clypeus submucronate, propodeum recalling *Osprynchotinae* because of the absence of well defined lateral carinae to the areolet which is separated from the petiolarea, basalarea nearly twice as wide as long.

Holotype—♀, Jordan, Ont, July 7, 1914. (W. A. Ross); No. 1580 in the Canadian National Collection, Ottawa.

Sesioplex relativus n. sp.

Related to *S. depressus* Viereck.

Female. Length 6 mm.; black, antennae black, mandibles mostly yellowish, palpi stramineous, tegulae yellowish, fore and mid coxae blackish at base, mostly stramineous, all trochanters and fore and mid femora stramineous, fore and mid tibiae and tarsi yellowish, hind coxae black, their femora reddish, hind tibiae reddish, the extensor surface yellowish at base and over the middle two-fourths, hind tarsi infuscated, the first and second joints yellowish at base, abdomen black, apical two-thirds of postpetiole reddish and concolorous with the second tergite, third and fourth tergites nearly concolorous with the third but with an apical blackish border, the remaining tergites black with a brownish stramineous apical margin, sheaths of the ovipositor blackish and apparently as long as the first tergite; basal area poorly developed, areola truncate at base, finely sculptured, confluent with the petiolarea which is slightly excavated and weakly transversely costate.

Holotype—♀, Ottawa, Ont., ex. *Solidago* gall (W. H. Harrington); No. 1581 in the Canadian National Collection, Ottawa.

Paratype—with the same data as the type.

Pyracmonoides new genus

Has been confused with *Pyracmon* Holmgren which it resembles but from which it may be known by its dentate clypeus recalling genera in the *Xoridinae*.

Genotype—*P. separatum* n. sp.

P. separatum n. sp.

Female. Length 8 mm.; black, antennae brownish at base, clypeus stramineous apically, basal half of mandibles yellowish, elsewhere the mandibles are brownish, palpi buff, tegulae yellowish, coxae mostly brownish to black, trochanters stramineous, femora reddish, fore tibiae with the extensor surface brownish and the flexor surface stramineous, contrastingly shorter than their femora, mid tibiae colored like the fore tibiae but darker, hind tibiae and all tarsi mostly infuscated, the former with the flexor surface reddish, abdomen

black above, blackish beneath, the sternites with pale margins; areola complete, apparently twice as long as wide, narrowly truncate at base, postpetiole planate, finely sculptured; sheaths blackish nearly two-thirds as long as the abdomen.

Male. Agrees with the above description of the holotype except as follows.—Scape and pedicel yellowish beneath, face yellowish save for a median longitudinal black mark, the yellow of the face extending acutely half way up on the front at the eye margin, clypeus almost entirely yellowish, fore and mid coxae partly and their trochanters wholly yellowish.

Holotype—♀, Fort Cudahy, Yukon, Aug. 25, 1896, (W. O'Gilvie); No. 1586 in the Canadian National Collection, Ottawa.

Allotype—♂, with the same data as the holotype.

Paratypes—3♂, Nordegg, Alta., July 25, 1921, (wood pile), (J. McDunnough).

***Pyracmonoides lipoparium* n. sp.**

Related to *P. separatum* Viereck.

Male. Length 8 mm.; black, antennae blackish above, scape yellowish beneath, pedicel and flagel reddish stramineous beneath, front, face and clypeus yellowish as in *P. separatum* Vier. but without a median blackish mark, mandibles mostly yellowish, palpi buff, fore and mid coxae and trochanters yellowish, fore and mid femora yellowish stramineous, fore and mid tibiae and tarsi dark stramineous, hind coxae black, their trochanters dark stramineous, their femora reddish, their tibiae and tarsi mostly infuscated, tegulae yellowish with a pale stramineous margin, abdomen black, the first tergite with a pale apical margin, the second tergite with a reddish apical margin, apical half of third tergite mostly reddish, sides of fourth and following tergites mostly brownish stramineous; areola and petiolarea confluent, finely sculptured, the former truncate at base, first tergite with a median longitudinal furrow.

Holotype—♂, Sudbury, Ont., 1891; No. 1582 in the Canadian National Collection, Ottawa.

***Pyracmonoides trochantericum* n. sp.**

Presumably related to *Pyracmon aldrichi* Davis.

Male. Length, 10 mm.; black, scape yellowish beneath, rest of antennae blackish, face and clypeus colored as in *P. separatum* Vier. but without yellowish marks on the front, mandibles mostly yellowish, palpi whitish, tegulae whitish with a pale stramineous margin, fore and mid coxae and trochanters and hind distal trochanters, whitish, fore and mid tibiae dark stramineous, their tibiae stramineous with the apex of the femora, flexor surface of the tibiae and all of the fore basitarsi more or less yellowish, rest of fore and mid tarsi more or less infuscated, hind legs blackish except as noted and for the proximal trochanters which are brownish, inner aspect of hind femora reddish brown, abdomen black; areola about as long as wide, truncate at base, finely sculptured and confluent with the petiolarea which latter is feebly, transversely costate, first tergite with a faint longitudinal furrow.

Holotype—♂, Teulon, Man., June 8, 1923, (A. J. Hunter); No. 1584 in the Canadian National Collection, Ottawa.

***Pyracmonoides succineum* n. sp.**

Related to *P. trochantericum* Viereck.

Male. Length, 8 mm.; black, agrees with the original description of *P. trochantericum* Vier. but differs as follows—hind coxae brownish stramineous hind femora dark reddish, blackish at apex; first tergite, without a median furrow, areola distinctly longer than wide.

Holotype—♂, Smith's Cove, N.S., May 2, 1920, (C. H. Thomas); No. 1583 in the Canadian National Collection, Ottawa.

***Pyracmonoides atypicum* n. sp.**

Related to *P. succineum* Viereck.

Male. Length, 8 mm.; black, scape partly yellowish beneath, pedicel brownish-black, pale at apex, flagel brownish, blackish at base, mandibles mostly yellowish, palpi stramineous, tegulae whitish, fore and mid legs including coxae and trochanters mostly stramineous, apical joint of fore tarsi and most of mid tarsi brownish, hind coxae and tergum of abdomen black, hind, proximal trochanters blackish, their distal trochanters, brownish stramineous, their femora dark reddish, their tibiae infusate but with a whitish base and a yellowish stripe down the middle of the back, hind tarsi infuscated, their basitarsi pale at base; areola, truncate at base, much longer than wide, finely sculptured, confluent with the petiolarea, the latter coarsely sculptured.

Holotype—♂, Metlakatla, B. C., 1911, (J. H. Keen); No. 1585 in the Canadian National Collection, Ottawa.

***Neonortonia nigripes* n. sp.**

Related to *N. genuina* Norton.

Male. Length, 8 mm.; black, including the antennae, mandibles mostly yellowish, tegulae mostly blackish, coxae black or blackish, trochanters at least partly yellowish excepting the proximal hind trochanters which are mostly blackish, fore and mid femora reddish stramineous, hind femora reddish except for a blackish area down the extensor surface, hind tibiae and tarsi blackish, fore and mid tibiae and tarsi yellowish and stramineous, abdomen reddish excepting the first tergite, the basal two-thirds of the second tergite, a lateral marginal stripe of the third tergite and the sixth and following tergites all of which are mostly black or blackish, plica and lateral edge of fourth and following tergites stramineous; areola and petiolarea confluent, the former nearly circular in outline.

Holotype—♂, Greys Mills, N.B., September 8, 1922, (R. P. Gorham); No. 1572, in the Canadian National Collection, Ottawa.

***Neonortonia graciliforma* n. sp.**

Related to *N. nigripes* Viereck.

Male. Length 7 mm.; black, scape beneath stramineous, mandibles mostly yellowish, tegulae pale stramineous, coxae blackish, fore and mid trochanters and distal trochanters of hind legs pale stramineous, proximal hind trochanters blackish, rest of fore and mid legs brownish stramineous, hind femora reddish, blackish at apex, hind tibiae and tarsi blackish, the former and the metatarsi stramineous at base, abdomen reddish except most of the petiole, much of the second tergite and the base of the third tergite all of which are blackish; areola truncate at base, confluent with the petiolarea, together transversely, coarsely

costate.

Holotype—♂, Winnipeg, Man., July, August, 1909, P. 139; No. 1569 in the Canadian National Collection, Ottawa.

***Neonortonia hullensis* n. sp.**

Related to *N. nigripes* Viereck.

Male. Length, 7 mm.; black, scape and pedicel dark stramineous beneath, mandibles mostly yellowish as are the tegulae, fore and mid legs including their coxae and trochanters dark stramineous, hind legs reddish throughout, abdomen black save for the postpetiole, the second tergite and the base of the third tergite which are mostly reddish and the plica which is yellowish; areola truncate at base, confluent with the petiolarea only the latter of which is transversely costate.

Holotype—♂, Hull, Que., June 10, 1894, (W. H. Harrington); No. 1570 in the Canadian National Collection, Ottawa.

***Neonortonia scaposa* n. sp.**

Related to *N. hullensis* Viereck.

Male. Length 7 mm.; black, scape yellowish, pedicel stramineous beneath, mandibles and tegulae mostly yellowish, as are the fore and mid coxae and trochanters, rest of fore and mid legs mostly dark stramineous, hind coxae reddish, yellowish at apex and blackish at base above, hind, proximal trochanters partly stramineous, partly blackish, hind, distal trochanters yellowish, hind femora reddish, hind tibiae with the basal and apical fourths blackish, the intermediate part mostly reddish, hind tarsi infuscated, the basal half of the hind metatarsi reddish; areola and petiolarea confluent, the former nearly acute at base, only the petiolarea transversely costate.

Holotype—♂, Greys Mills, N. B., Sept. 16, 1922, (R. P. Gorham); No. 1573 in the Canadian National Collection, Ottawa.

***Neonortonia laevissima* n. sp.**

Related to *N. scaposa* Viereck.

Male. Length, 7 mm.; black, antennae blackish throughout, mandibles with a yellowish mark, palpi whitish, tegulae brownish stramineous, yellowish anteriorly, coxae blackish, proximal trochanters of fore and mid legs mostly yellowish, blackish or brownish above and at base, hind proximal trochanters mostly blackish, narrowly yellowish at apex, all distal trochanters yellowish, femora reddish, the hind pair blackish at apex, fore and mid tibiae with the flexor surface reddish stramineous, the extensor surface yellowish, hind tibiae and tarsi blackish, fore and mid tarsi with the first and second joints partly yellowish, the succeeding joints brownish, abdomen mostly reddish, the first tergite and most of basal two thirds of the second tergite black, plica yellowish; areola complete, pentagonal, nearly equilateral, the basal area transversely costate.

Holotype—♂, Annapolis, N.S., Oct. 9, 1923, (R. P. Gorham); No. 1571 in the Canadian National Collection, Ottawa.

***Neonortonia crassata* n. sp.**

Related to *N. laevissima* Viereck.

Male. Length, 5 mm.; black, antennae blackish or black throughout, mandibles mostly yellowish, palpi yellowish, tegulae yellowish and pale stramineous, fore and mid coxae reddish stramineous, hind coxae mostly blackish but

reddish-brown beneath, trochanters and femora of fore and mid legs stramineous, their tibiae and tarsi mostly yellowish, hind trochanters blackish above, reddish beneath, hind femora reddish, their tibiae brownish stramineous with the basal and apical thirds blackish, hind tarsi blackish, abdomen black or blackish except for pale apical margins to the second and third tergites, an apical brownish margin to the third tergite, sternites mostly blackish with a yellowish apical margin, pale apical margin of second tergite with a black cuneiform mark on each side, claspers brownish; areola and petiolarea confluent, the former truncate at base, posterior aspect of propodeum beyond the basal transverse carina very coarsely subdivided by irregular carinae.

Holotype—♂, Marshall's Bay, Arnprior, Ont., Aug. 4, 1913, (C. G. Hewitt); No. 1568 in the Canadian National Collection, Ottawa.

***Pseuderipternoides deceptus* n. sp.**

Related to *P. porrectus* Cresson.

Female. Length 6 mm.; black, scape and pedicel yellowish beneath, mandibles mostly yellowish, palpi stramineous, tegulae yellowish with a pale stramineous margin, fore and mid legs mostly stramineous, the trochanters palest, hind coxae blackish, rest of hind legs mostly stramineous, all femora rather reddish stramineous, abdomen blackish above, the outer sides of the third, fourth and fifth tergites and the lower edge of the outer side of the succeeding tergites reddish, plica yellowish; areola and petiolarea confluent, the former truncate at base, and finely reticulated, the petiolarea partly costate, basalarea nearly parallel sided; sheaths of the ovipositor at least two-thirds as long as the abdomen.

Holotype—♀, Greys Mills, N.B., Sept. 15, 1922, (R. P. Gorham); No. 1574 in the Canadian National Collection, Ottawa.

***Pseuderipternoides hexagonalis* n. sp.**

Related to *P. paeneporrectus* Viereck.

Female. Length, 7 mm.; black, scape stramineous beneath, basal two-thirds of mandibles yellowish, palpi pale stramineous, legs almost entirely stramineous, the fore and mid coxae and trochanters palest, hind tarsi infuscated, tegulae yellowish stramineous, abdomen mostly reddish, the petiole mostly black, postpetiole reddish, blackish at extreme apex and extreme sides, sixth and seventh tergites mostly blackish; propodeum finely sculptured, the areola longer than wide, pentangular, truncate at base, the basal area incomplete, nearly parallel sided, petiolarea transversely costate; sheaths of the ovipositor a little more than half as long as the abdomen.

Holotype—♀, Lethbridge, Alta, June 27, 1923, (H. L. Seamans); No. 1575 in the Canadian National Collection, Ottawa.

***Pseuderipternoides neglectus* n. sp.**

Related to *P. melanerythrogaster* Viereck.

Female. Length, 6 mm.; black, scape and pedicel yellowish beneath, mandibles mostly yellowish, palpi stramineous, fore and mid legs stramineous throughout, their trochanters palest, tegulae yellowish, hind coxae and proximal trochanters, blackish, hind distal trochanters yellowish, their femora, tibiae and metatarsi brownish-stramineous, the remaining tarsi infuscated, abdomen black,

apical third of second tergite mostly reddish, the fourth tergite mostly reddish, blackish at base, the fifth tergite more reddish than the fourth but black in the middle at base, fifth tergite black except at apex and on the sides where it is respectively stramineous and reddish, sixth and seventh tergites mostly black, the apical margin stramineous and the lower end of the sides stramineous to reddish stramineous, plica yellowish; areola and petiolarea confluent, the former finely sculptured, truncate at base, the latter transversely costate, basal area complete and nearly parallel sided; sheaths of the ovipositor nearly two-thirds as long as the abdomen.

Male. Characters essentially as in the female but differing especially as follows—flagell slender, not so hairy, fore and mid coxae and trochanters yellowish, hind tibiae at base and apex and all of their tarsi infuscated, apical half of second tergite mostly reddish to yellowish, third tergite reddish save for an apical blackish margin.

Holotype—♀, Ottawa, Ont., (W. H. Harrington); No. 1576 in the Canadian National Collection, Ottawa.

Allotype—♂, with the same data as the holotype.

Paratype—♂, Coaticook, Que., Sept. 12, 1913, (J. I. Beaulne); this lacks the abdomen—it may prove to be non-conspecific.

***Pseuderipternoides pulchellus* n. sp.**

Related to *P. porrectus* Cresson.

Female. Length, 6 mm.; black, scape yellowish beneath, mandibles mostly yellowish, palpi stramineous, tegulae yellowish, fore and mid legs stramineous throughout, hind legs reddish or stramineous excepting the base and apex of hind tibiae, all of the tarsi and the proximal trochanters all of which are infuscated, abdomen reddish, the basal two-thirds and extreme apex of the second tergite blackish except at extreme sides and down the middle to the basal third where this tergite is concolorous with the succeeding tergite and its apical third, fifth and following tergites black down the back, the sides of the fifth reddish, the lower edge of the sides of the sixth and seventh like the apical edge of those tergites stramineous; areola and petiolarea confluent, the former truncate at base and finely sculptured, the latter transversely costate, the basalarea nearly parallel sided; sheaths of the ovipositor apparently half as long as the abdomen.

Holotype—♀, Greys Mills, N.B., Sept. 15, 1922, (R. P. Gorham); No. 1577 in the Canadian National Collection, Ottawa.

This may prove to be only a variety of *P. deceptus* Vier.

(To be Continued)

NEW LIFE HISTORIES IN PAPAPEMA No. 23 (LEPIDOPTERA).

BY HENRY BIRD,

Rye, N. Y.

Of several species of *Papaipema* described by Dr. H. G. Dyar in 1908, two, *ochroptena* and *anargyrea*, came from Colorado, *Gortyna* however being the generic term under which the names were proposed. But few additional examples have since appeared and their larvae are unknown, so far as the writer has information.

Still another, *unimoda* Sm., is a Colorado denizen, also unknown as a larva, though several locality references for the latter make it appear that the larval foodplant is at least well distributed. This adult, in the male, presents a certain genitalic departure from the customary pattern, which feature is shared by a single other eastern one, *frigida* Sm., and it is assumed *unimoda* larva may also share in the striking larval peculiarity wherein its eastern prototype so admirably links up the indigenous *Papaipema* with the larvae of *Gortyna* and allies which have a north temperate, worldwide distribution.

In the summer of 1924, an opportunity availed for some Colorado explorations, with special effort made to run down the larva of *unimoda*. It was inferred that its foodplant might be some characteristic perennial of the drier Colorado flora, of which there is an inviting list. Presumably the known examples of *unimoda* had been captures at light and a majority seem to have come from Durango, or the vicinity. So it was at this point and through similar country in southern Colorado that the search was made, but it proved without success so far as this species was concerned. A long list of suitable plants was worked over in the process of elimination and it became very clear that these borers, as a group, do not exist there as they do similarly in the East. Such extensive stands and primitive conditions there flourish as is usually congenial to them and we all too frequently recalled Dr. Banks' pleasantry "that the *Papaipemas* have yet missed a fine lot of opportunities."

P. ochroptena. Midway on Ratun Pass, at about the dividing line of New Mexico, a small canyon wherein a stream was flowing, proved a station for a considerable growth of Hop. Here, numerous examples of that Cecidomyid stem gall, *Lasiopter humulicaulis* Felt, were observed—great ones up to forty-five centimeters in length—and after much search, a few of the *Papaipema* stem galls, the two being frequently ecological partners in the East. While several of the gall borers were secured, but one adult was reared therefrom, it being difficult to carry on larvae in these galls when detached from the growing root. Even though kept in water, deterioration is rapid so that larvae must be near maturity if they successfully continue in the gall, sufficiently to pupate. The one moth reared proved to be *ochroptena* and furthermore established the fact that there simply exists varietal difference between it and the eastern *P. humuli* Bird. The larvae of both are identical and their habit and procedure agree fully.

A feature of the foodplant may be discussed. Hop is well distributed in Colorado, as suitable locations occur, and proceeding southward with increasing aridity the plant takes on a considerable difference in leaf formation and flowering bract. A. Nelson and Cockerell had given the varietal name *neomexicanus* to this form of *Humulus*; Rydberg however contends it is distinct from *H. lupulus* of Europe. While not within our province to pass on the taxonomic details, there is no question Hop has existed in America since remote times—it is no post-Columbian introduction. Early botanists leaned to the idea that Hop came to us since the advent of Europeans, but this cannot be so for it has a numerous insect fauna and the *Papaipema* and *Lasioptera* species, in their specialized instance, have made no random selection of a European waif. While the plant at Ratun Pass was of the *neomexicanus* variety, *ochroptena* is not restricted to the boundary of the foodplant variation, for the typical insect has been taken at

Denver where Hop is of the normal *lupulus* pattern.

In 1904 the larva of the Hop Papaipema was first observed by the writer at Rye, N.Y., and here and elsewhere, it has yearly been under observation since. A note on its larval history was published in this journal in 1907, p. 137,—the species then being called "*circumlucens*" by Smith—and the details of larva need not again be repeated. The western variety agrees in dates of emergence, the records of larval happenings and the unique features which surround the better known form.

Most noteworthy is its seeming freedom from parasitism. Our twenty years observation has failed to note a single instance, or to meet with the first clue in the deserted gall which would be an index to such a happening. And we have been searching painstakingly for this very data, since from the dwelling so much can be reconstructed of what befell the inhabitant. The compilation of what occurred in a thousand instances with some of these species, particularly those which pupate in their burrows, offers a valid panorama of experiences, such as can rarely be duplicated elsewhere in foretelling what actually befell any such number of individuals in the field.

By analogy we should expect *Microbracon lixi* Ashm. to be especially active here, as it is in the early stages of so many of the allies. None would be safe from this female's ovipositor. How do the *Apanteles* and the *Hemiteles* miss them, particularly *Apanteles papaipemae* Mus.? They always leave evidence of having been a visitor, by their cocoon cluster, so we are sure, when these have not appeared.

Masicera senilis Meig., an associate and chief check with most *Papaipema* and many other borers, from Cape Breton Island to the Rocky Mountains, passes *ochroptena-humuli* by. Inferentially our subject should be its easiest mark.

The large opening in the gall for frass disposal would allow *senilis* to place its viviparous larva in bodily contact with the host, whereas it seems ordinarily placed to await the chance coming of the host to its orifice doorway. No suspicion attaches to this Tachinid however, while *P. nebris* similarly situated in its gall in *Ambrosia*, suffers from the inroads of *senilis* to more than twenty per cent. in most seasons.

Can it be that Hop imparts a flavor to these larvae which is repellant to internal parasites? It might seem so. There is much evidence that certain food-plants contain properties which furnish a body media more suitable for bacterial diseases, than other certain plants do, so it seems possible parasitic larvae may be also affected.

Since the gall is deserted and pupation occurs in the ground, that phase of the borers existence is not open to the prying attacks of *Amblyteles* and others, which exert no mean influence among all the allies where the chrysalis remains in the burrow. Other than two Drosophilids which work in the chewed fragments and excrementitious matter packed in the upper end of the gall, no associates have been observed.

But the Hop-gall Papaipema has its hazards. They arise from the nature of its foodplant and the features—mechanical we might call them—of the gall formation. The mature larva attains a major diameter of 6 mm. and is a chunky

one for the role it fulfils. Too frequently, the stem selected is of such small size that it is incapable of producing a gall of sufficient caliber, to meet the larva's requirement, and either a dwarf adult follows or the enlarging larva leaves the gall altogether, in which case it almost surely starves. Sometimes they get in where several stems are curled together, but I have never seen them succeed this way. Most *Papaipma* can change about and form new galleries, not so with this one. It can only make a domicile for itself by boring in as a first or possibly second stage individual, in the very advancing end of the vine when it is in its early vigor. The gall which forms around it almost immediately shows some change in its chlorophyll, the walls become yellow and it seems this particular type of affected tissue is what alone will serve as food. They will starve if offered only leaves or the cut stems of the plant, and certain it is they cannot again ensconce themselves when they have become half grown. Our records show these inadequate and deserted galls amount to about thirty per cent. in the total evidence of their work. In rich, moist situations, where the vines are luxuriant, their chance is better.

None of the congeners have such insecure domiciles and this instance may point the way to what perhaps happened to some of the ancestral stock which seems to have lived in even more inadequate shelter. The peculiar way in which the longitudinal lines that show so prominently on the thoracic and last four abdominal segments of the larvae are broken at the middle, with here the dark body color appearing as an unmarked girdle, suggests that some progenitor lived in a mere ring-like habitation with both extremities free.

As this unique marking holds in the early stages of forty different larvae, but becomes lost at maturity, the inference seems clear that the feature points to some ancient characteristic which long held sway. Occasionally *humuli* larvae have been seen occupying such abbreviated quarters that their anal segments were exposed.

In their systematic relationship *ochroptena* and *humuli* represent a valid racial difference. In 1899, Dr. J. B. Smith considered both these forms together with a distinct one which feeds in Dogbane, under the name *circumlucens*, and all three were represented among his types and co-types. For what seemed valid reasons, the writer restricted this name to a certain type of the Dogbane feeding species which stands in the U. S. National Museum.*

In announcing the sex of that specimen however, an error was made, and Dr. Dyar, who called my attention to this, suggests that this note of type fixation be amended to read "the type labelled *male* by Smith in the U. S. National Museum," instead of "the *female* type of the U. S. National Museum."

This action removed *humuli* from consideration under the *circumlucens* label. From the latter *ochroptena* differs notably in being a pale clay yellow, as against the brick-red brown of *humuli*. Dr. Dyar evidently considered them fully distinct species at the time he proposed *ochroptena*, and as his name has priority the bibliography will stand;

P. ochroptena Dyar, 1908,
race *humuli* Bird, 1915.

*—Can. Ent. Vol. xlviii. p. 16 (1916).

SOME SYRPHID SYNONYMY, (DIPTERA).*

BY C. H. CURRAN,

Ottawa, Ont.

An examination of several hundred specimens of the genus *Mesogramma* reveals the fact that two variable species have been redescribed under different names. In both cases the paler forms have been described originally, the forms with dark abdominal bands being subsequently described. From the material before me the following synonymy suggests itself, typical specimens of the various named forms being on hand.

Mesogramma floralis* Fabr.Ent. Syst.*, Suppl. 563. (French Guiana).*Mesogramma parvula* Loew, Cent. VI, 1865. (Florida).*Mesogramma subannulata* Loew, Cent. VI, 48, 1865. (Cuba).***Mesogramma basilaris* Wd.***Syrphus basilaris* Wied., Aus. Zweifl., II, 143, 1830. (Brazil).*Mesogramma soror* Schiner., Novara, 1868 (Already placed by Williston). (S. Am.).*Mesogramma variabilis* V. d. Wulp, Tijdsch. v. Ent., XXVI, 6, 1883. (Guadeloupe).*Mesogramma diversa* Giglio-Tos, Boll. R. Univ. Tor., VII, No. 132, 1892. (Mexico).*Mesogramma bidentata* Giglio-Tos, Ditt. del Mess., II, 49, 1892. (Mexico).

Both these species have a wide range, the darker forms being more evident in the northern part of their range. *M. floralis* has a yellow spot above the anterior coxae, while *basilaris* lacks it. The ♀ normally has a blackish median facial vitta, at least on the upper half. Both occur in all the West Indian Islands while *floralis* extends as far north as Virginia.

Mesogramma laciniosa* Loew.M. laciniosa* Loew, Cent. VI, 50, 1865. (Cuba).*M. pulchella* V. d. Wulp, (nec Macq.), Tijdsch. v. Ent., XXVI, 1883, pl. XI, f. 2. (Guadeloupe).

There can be no doubt about this synonymy being correct. *M. pulchella* has the lateral oval spots on the third and fourth abdominal segments transverse, not oblique and somewhat comma-shaped.

NOTES ON SOME SPECIES OF THE GENUS ANARTA

(LEPIDOPTERA).*

BY J. MCDUNNOUGH,

Ottawa, Ont.

Anarta richardsoni Curt. The name *feildeni* McLach. has been omitted from the synonymy of this species in the 1917 Check List. The species was doubtfully described as a *Mamestra* (1897, Jour. Linn. Soc., XVI, 112) and the original description makes mention of spined tibiae. Later in the same paper (p. 122) the author himself, after a comparison of the male genitalia of *feildeni* with those of the type specimen of *septentrionis* Wlk. and other specimens of *richardsoni* Curt., reaches the conclusion that *feildeni* is at best a mere form of Curtis' species. As the genitalia are very striking and not liable to be confused with those of other species, it seems best to accept McLachlan's reference and attribute his statement regarding spined tibiae to an oversight.

***Anarta leucocycla albertensis* n. var.**

Through the kindness of Mr. K. Bowman of Edmonton I have recently had the opportunity of examining a male and female taken on the top of the

*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Coliseum Mt., Nordegg, Alta., which appear to represent a distinct race worthy of a name; the forewings resemble those of a dark *moeschleri* from Labrador with the orbicular very noticeable as a white oval spot; the hind wings are decidedly pale yellow with a narrow, blackish, terminal border, about half the normal width for *leucocyta* and *moeschleri*; the base of the wing is suffused with black and there is a fine black discal lunule and traces of a dotted black post-median line. The underside of the hindwings is very similar to the upper, but the border is still narrower.

As the male genitalia show no appreciable difference from those of a specimen of *leucocyta* from Greenland and also from the Labrador *moeschleri*, I am treating this form as a race of *leucocyta* and believe that *moeschleri* should also be considered a race of this same species, as is done by the continental European authorities.

Holotype—♂, Nordegg, Alta., July 20, 1924, (K. Bowman); No. 1532 in the Canadian National Collection, Ottawa, through the courtesy of Mr. Bowman.

Allotype—♀, same data, in Mr. Bowman's collection.

Anarta acadensis Beth. For long years this species has appeared in our lists as a race of the European *myrtilli* Linn. It was originally described in a paper on Nova Scotian Lepidoptera which appeared in the Proceedings of the Nova Scotian Institute of Natural Science, Vol. 11, Pt. III. pp. 78-87, and on page 85, opposite the description, there is a rather poor wood-cut of the species. Whilst this figure does not even bring out the salient features of the maculation mentioned in the description, notably the white areas around the orbicular of primaries, it does distinctly show that the species cannot possibly be associated with *myrtilli*. From a careful study of both figure and text, I believe that the true *acadensis* is the species at present going under the name of *Cryptocala* (*Rhynchagrotis*) *gilvipes* Grt.; the type of *acadensis* has presumably been destroyed (vide Smith, Can. Ent., 1891, XXIII, 117) but certain specimens before me of the above mentioned species match the description so well that I would transfer without hesitancy *acadensis* to *Cryptocala* where it takes priority over *gilvipes* Grt. The name *myrtilli* should presumably be dropped from our lists as I know of no authentic records of this European species from North America, although Smith (1908, Ann. N. Y. Acad. Sci., XVIII, 109) doubtfully records the species from Colorado.

Anarta impingens Wlk. The species was described from specimens taken by Lord Derby in the Canadian Rockies and the name should be restricted to the small form taken at Laggan, Alta. and in the surrounding region; for the larger, better marked, Coloradan race the name *curta* Morr. is available. There is some difference in the male genitalia of these two forms, notably in the length of the dorsal projection (pollex) near the apex of the clasper, which in *curta* is much longer than in *impingens*.

Anarta laerta Sm. I doubt if this so-called species can be considered as anything more than a form or race of *melanopa* Thun., comparable to the European varieties *vidua* Hbn. and *wistromi* Lampa. I have made a number of slides of the genitalia of specimens from Scotland, Utah, Rocky Mts. of

Alberta, and Coast Range of British Columbia and find that considerable variation exists in the shape and length of the apical portion of the sacculus; the Utah specimen which was received from Dr. Barnes and marked as agreeing with a specimen compared with the type of *laerta* is much closer to the Scotch specimen in shape of the sacculus than are the Alberta specimens which otherwise agree with *melanopa* in maculation, whilst the British Columbia specimens are rather intermediate between the two, although quite close to the Utah specimen in amount of black on the secondaries.

NEW COLEOPTERA XI.

BY H. C. FALL,
Tyngsboro, Mass.

***Dyschirius criddlei* n. sp.**

Of large size, reddish brown throughout. Head broadly transversely impressed between the eyes, front and vertex coarsely transversely wrinkled, not noticeably punctulate; epistoma truncate at middle, lateral angles prominent. Prothorax slightly ovate, $1/6$ longer than wide, anterior impressed line strongly rugose, surface feebly transversely wrinkled throughout. Elytra barely perceptibly wider than the thorax, twice as long as wide, sides parallel in basal half; striae fine, traceable throughout but nearly effaced at the extreme base; stria punctures very fine, disappearing at about the middle; third interspace with a single very fine setigerous puncture near the middle close to the second stria. Front tibiae not dentate externally as viewed from the front, terminal process moderately curved and distinctly longer than the spur. Length 5.4 mm.; width 1.7 mm.

Described from a single male specimen collected at Baldur, Manitoba, 15-VII-1923, by Mr. Norman Criddle, from whom I have received it and to whom it is dedicated with a keen appreciation of his success in bringing to light rare species of the Canadian fauna, and of many kind donations to my own cabinet.

The present species is quite unlike in color any species of *Dyschirius* known to me, being in this respect almost precisely like *Clivina impressifrons*, which species it also approaches in size. It is possible that the color may be due to immaturity but there is no other indication of this. It is larger than any species of our fauna except *obesus* and *marinus* and the more or less mythical *edentulus* Putz., which is said to have a length of 7 mm. Although *sphaericollis* and *truncatus* are said to attain a length of 5.5 mm., the largest specimens in my collection do not much exceed 5 mm. The presence of a single puncture on the third interspace of the elytra, if normal, is a remarkable character, known to me only in *unipunctatus*, and its situation close to the second stria is also exceptional, the usual position being close to the third stria. The rufous color, together with the fact that this insect is one of a lot of specimens sent me as having been taken on the shore of an alkaline lake, suggests at once that it may belong to that small group of paler colored species known to be partial to such situations; the facies is however different from that of the *salivagans* group, and the presence of two setigerous punctures in the impressed apical portion of the eighth stria indicates that it is not closely allied to *salivagans*, *sellatus* or *punctipennis*, in all of which, so far as I have examined specimens, there is

only a single setigerous puncture so situated. There is in this same Baldur lot a single example of a *Dyschirius* truly belonging to the *salivagans* group. It is closely allied to *salivagans* but differs in the somewhat more oval, less parallel-sided thorax, generally less narrow form and more prominent eyes. It is not unlikely a distinct species, but I am unwilling to describe it without confirmation of these characters by other specimens.

Since writing the above I have received from Mr. Criddle a second specimen of *criddlei*. It is even larger than the first (6.8 mm.) and agrees with it in all respects except that the transverse wrinkling of the head and thorax is less pronounced. This specimen was taken by Mr. Criddle, June 23, 1924 at Baldur, and was the only one secured. It will be deposited as a paratype in the National Collection at Ottawa.

Dyschirius desertus n. sp.

Moderately elongate, black with feeble green-bronze lustre, antennae and legs dark rufous, the front thighs becoming piceous above. Epistoma broadly emarginate, the bottom of the emargination just perceptibly bisinuate. Front moderately transversely impressed, vertex smooth. Prothorax ovate, very slightly longer than wide, a little narrowed towards the front, transverse anterior line not at all rugose, side margin very fine. Elytra parallel, twice as long as wide, sides broadly feebly arcuate; striae entire, a little impressed except at the extreme base and toward the sides, punctate throughout, though very finely so apically; third interspace tripunctate, the punctures virtually on the third stria. Body beneath piceous to rufopiceous; anterior tibiae not dentate on external margin, terminal process long, moderately curved, longer than the apical spur, the latter subequal in length to the first two tarsal joints. Length 4.9 mm.; width 1.5 mm.

The unique type is a female collected by Mr. G. R. Pilate at Olancha (Owen's Lake) California, June 18, 1916.

By LeConte's table this species must be referred to the first group with tripunctate third interspace of elytra, and may precede *aeneolus* in a cabinet arrangement. It is the largest species of the group thus far described.

Anisotoma

The two following species are allied to *A. obsoleta* by the vertical mesosternum, and will possibly be found mixed with it in collections.

Anisotoma puritana n. sp.

Rather broadly evenly suboblong oval, moderately convex, flavo-or rufotestaceous throughout, the antennal club not darker; surface moderately shining, not alutaceous. Antennal club strongly transverse, joints 9 and 10 about twice as wide as long. Prothorax about $3/5$ wider than long, hind angles broadly obtuse but well defined, surface very minutely sparsely punctulate. Elytra $1/5$ longer than wide, with regular unimpressed series of moderately fine punctures; interspaces with sparse irregular minute punctures like those of the thorax, the third with a widely spaced series of coarsened punctures. Prosternum not carinate, mesosternum vertical between the coxae and finely carinate; metasternum numerous punctate except postero-medially; ventral segments with fine irregular punctation, and with at most but feeble indication of the series

of coarse punctures along their basal margins. Length (type) 2 mm., width 1.2 mm.

Male. In this sex the four anterior tarsi are a little dilated and squamose beneath, the middle tibiae more noticeably arcuate within, hind thighs with the posterior condyle angulate but not triangularly produced.

Described from three examples (2♂, 1♀), collected and given me many years ago by Mr. Frederick Blanchard. They were all taken in the vicinity of Tyngsboro, Mass., the single ♀ bearing the label Dracut 7-26-88.

As compared with typical *obsoleta* in the LeConte collection, the present species is distinctly narrower and less rotundate oval, the ventral segments do not show distinctly the rows of conspicuous coarse punctures so characteristic of *obsoleta*, and the apex of the posterior thighs is not triangularly produced, being but slightly more distinctly angulate than in the female.

Anisotoma fusciclava n. sp.

This name is proposed for a form occurring in Southern California which differs in its rather less broad antennal club, which seems normally to be fuscous or blackish rather than concolorous as in *obsoleta* and *puritana*. The form is slightly stouter than in *puritana* but less rotundate than in *obsoleta*. The posterior condyle of the hind femora is angularly produced in the male. There is observable a not very conspicuous series of coarser punctures along the base of the first one or two ventral segments.

The type is a male from Ojai, Cal. and measures 2.1 x 1.35 mm. A second ♂ from Pomona is 2 x 1.3 mm. in size.

Hyperaspis pluto n. sp.

Subrotundate, rather strongly convex, entirely black above except for the side margins of the prothorax which are very narrowly reddish yellow. Upper surface polished throughout, with barely perceptible alutaceous sculpture in the clypeal region. Punctuation fine, sparse and nearly uniform throughout, the punctures separated on the average by about three times their own diameters; a little closer narrowly along the front and side margins of the thorax. Body beneath black, tarsi and inner face of tibiae more or less rufous; metasternum closely rather coarsely punctate, ventral segments less densely and more finely punctured, especially at middle. Length 3.75 mm.; width 3 mm.

The type is a female taken by the writer in the San Bernardino Mountains, Southern California, elevation 6,000 ft., July 3, 1917.

This is one of the largest species of the genus known to me. In size, form and sculpture it agrees nearly with *excelsa*, except that it is a little less convex, and the femoral excavation of the epipleura here shows as a conspicuous rather abrupt sinuation of the margin when viewed from the side, whereas in *excelsa* this sinuation is barely perceptible.

Hyperaspis jovialis n. sp.

Broadly, evenly oval, moderately convex; black, thorax with a creamy white lateral margin about two fifths longer than wide, parallel sided but with its inner liprit a little uneven; elytra each with a broad orange yellow discal vitta beginning at about the basal seventh and terminating at an equal distance before the apex, where it curves in a little toward the suture; it is narrowed

at its base by an exterior emargination, its width at middle is subequal to the interval across the suture, the distance from the suture being about twice that from the lateral margin. The upper surface is very strongly shining, the integument polished throughout, the head very feebly alutaceous; punctation fine and sparse. Beneath more strongly and closely punctate; femora black, tibiae and tarsi rufotestaceous. Length 2.5 mm., width 1.8 mm. Elytra $1\frac{1}{9}$ longer than wide; head rather less than $\frac{3}{5}$ as wide as the thorax, the latter $\frac{5}{6}$ as wide as the elytra.

Havilah, Kern Co., California, VI-5-1913; a single female collected by G. R. Pilate.

There is no described species in our fauna comparable with the present one in elytral markings.

BOOK NOTICE

Insects and Disease of Man, by Carroll Fox, M.D. Surgeon, U. S. Public Health Service, 92 Illustrations, 8vo. XII+ 249 pages. Cloth \$4.00. P. Blakiston's Son & Co., Publishers, Philadelphia.

This is a thoroughly practical work on medical entomology, and is intended for the Field Health Officer, Physicians, Entomologists, and others. The first part deals with the Classification, Identification, Anatomy, Life History, General Considerations, Key to Sub-families, etc., together with a chapter on Arachnida and Rodents and Notes on technique.

Part II discusses the diseases carried by Arthropods among human beings. Under each disease is given the Causative Agent; Source of Infection; Mode of Transmission; Period of Incubation, Communicability; Epidemiology, etc.; Recognition of the Disease, Prevention and Control, Treatment of Carriers, Prophylaxis and all practical points including the smaller details, such as the articles required, detailed instruction in the preparation of material, and the investigations to be made by the field worker. The author has had considerable experience in the U. S. Public Health Service and has written a book which is truly practical in all respects.

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